I claim:

1.   In a computerized system, a method of identifying an optimum set of product
configurations from a plurality of possible product configurations, each product configuration
having a plurality of selectable features, each selectable feature having a plurality of options,
comprising the steps of:

    representing each of the plurality of possible product configurations as
an ordered set of dimensions, each selectable feature being represented by one
respective dimension of the ordered set;

    identifying a plurality of valid product configurations as a subset of the
possible product configurations;

    defining configuration neighborhoods that identify at least one valid
product configuration captured by another valid product configuration;

    defining an optimization model to identify the optimum set of valid
product configurations based on a desired objective;

    solving the optimization model; and

    presenting the optimum set of valid product configurations that satisfy
the desired objective.

2.   The method of claim 1 further comprising the step of associating a cost and a revenue
to each valid product configuration.

3.   The method of claim 2 wherein the cost associated with each valid product
configuration is comprised of a plurality of per option costs.

4.   The method of claim 1 further comprising associating a demand to each valid product
configuration.

5.   The method of claim 4 wherein the demand associated with each valid product
configuration is based on the demand of each respective option of the valid product
configuration.

6.   The method of claim 1 wherein the desired objective is to maximize the profit of a
manufacturer or retailer of the products.

7.   The method of claim 1 wherein the desired objective is to minimize the costs of a manufacturer of the products.

8.   The method of claim 1 wherein the desired objective is to maximize coverage of customer demand.

9.   The method of claim 1 wherein the optimization model is defined when the optimum set of product configurations is fixed.

10.   The method of claim 1 wherein the optimization model is defined when the optimum set of product configurations is variable.

11.   The method of claim 1 wherein the dimensions of the ordered set represent the features in a fixed and non-modifiable order.

12.   The method of claim 1 wherein the step of identifying the valid product configurations comprises the steps of applying mix-and-match rules to identify invalid or impermissible product configurations.

13.   The method of claim 12 wherein the step of identifying the valid product configurations further comprises the step of conducting fast enumeration on partial configurations.

14.   The method of claim 1 wherein the step of defining configuration neighborhoods comprises the step of defining a relation structure.

15.   The method of claim 14 wherein the relations structure is an upgrade relation that identifies at least one feature having an option that is upgradeable for no additional cost to a customer of the product configuration having the upgrade option.

16.   The method of claim 14 wherein the relation structure is a convert relation that identifies at least one feature having an option that is convertible to another option at a respective conversion cost.

17.   The method of claim 14 wherein the relation structure is an acceptance relation that identifies at least one feature having an option that is acceptable to a consumer desiring a different option at a respective acceptance value.

18.   The method of claim 17 wherein the acceptance value is a probability that the customer will accept the acceptance option instead of the different option.

19.   The method of claim 14 wherein the relation structure is an acceptance relation that identifies a plurality of features, each feature having a respective option that is acceptable to a consumer desiring respective different options at a respective acceptance value, the acceptance value being the product of the probabilities that the customer will accept each respective different option.

20.   The method of claim 14 wherein the relation structure identifies at least one valid product configuration that captures another valid product configuration through an upgrade, conversion, or acceptance of at least one option.

21.   The method of claim 1 wherein the product is a manufactured good.

22.   The method of claim 1 wherein the product is a service.

23.   In a computerized system, a method of identifying an optimum set of product configurations comprising the steps of:

receiving product configuration data representative of a plurality of possible product configurations capable of manufacture by a company;

identifying a plurality of selectable features associated with the plurality of possible product configurations;

identifying a plurality of options associated with each respective selectable feature;

representing each of the plurality of possible product configurations as an ordered array of the selectable features;

identifying a plurality of valid product configurations as a subset of the plurality of possible product configurations;

defining an optimization model based on achieving a desired objective;

solving the optimization model to identify the optimum set of valid product configurations that achieves the desired objective; and

presenting the optimum set of valid product configurations to the company.

24.   A computerized system for identifying an optimum set of product configurations comprising:

a configuration generator for receiving product configuration data, the product configuration data representative of all possible product configurations, each product configuration defined by a plurality of features, each feature having a plurality of options, the configuration generator applying mix-and-match rule to identify a subset of valid product configurations, the configuration generator further representing each of the valid product configurations as an ordered array;

a demand simulator for calculating relative demand for each of the valid product configurations;

a cost calculator for calculating and associating a cost of manufacture for each of the valid product configurations;

a revenue calculator for calculating and associating a revenue potential for each of the valid product configurations;

an objective-based modeler for defining an optimization model and for receiving product configuration information from the configuration generator, the demand simulator, the cost calculator, and the revenue calculator; and

an optimization engine for solving the optimization model and presenting the optimal set of product configurations and for presenting costs, revenue, and parts needed for the optimal set of product configurations.